

**REMARKS/ARGUMENTS**

This case has been reviewed and analyzed in view of the Official Action dated 12 February 2004. Responsive to the objections and rejections made by the Examiner in the Official Action, Claim 1 has been amended, Claim 2 has been canceled, and a Substitute Fig. 5 is being provided to more clearly clarify the inventive concept of the Applicant.

The Examiner has objected to the Drawings due to the fact that element 51 of the originally filed Fig. 5 was labeled "Singnal Conversion Device". A substitute page including Figs. 5, 6, and 7 is being attached to this Amendment for the Examiner's approval. The substitute Fig. 5 includes the "Signal Conversion Device" element 51; corrected for typographical errors.

Prior to a further discussion of the Examiner's objections and rejections made in the outstanding Official Action, it is believed that it may be beneficial to briefly review the subject Patent Application system in light of the inventive concept of the Applicant. The subject Patent Application system is directed to an optical tracking device for controlling a cursor of a computer display. As shown in Fig. 3 of the subject Patent Application Drawings, the system 100 includes a movable body 10, such as a mouse, and an optical sensor 20. The optical sensor 20 is provided within cavity 11 and includes phototransistors 21, received within transparent casing 22. Light emitting element 30 generates light which is reflected from zones 41 of pad 40 and received by

phototransistors 21. The phototransistors 21 are covered and protected by the transparent casing 22.

The Examiner has rejected Claims 1 and 3 under 35 U.S.C. § 102(b) as being anticipated by the Tsunekuni Patent #4,712,100. It is the Examiner's contention that all elements of Claims 1 and 3, as originally filed, are taught by the Tsunekuni reference.

The Tsunekuni reference is directed to a coordinate inputting apparatus using multiple sensors. As shown in Fig. 3 of the Drawings, the operating section 4 has a head 4<sub>1</sub> adapted to be grasped by means of the palm of a hand upon operation. A slide surface 4<sub>2</sub> having a proper extent is provided on the lower side of the operating section 4. Light emitting sections 5, 9, and 6 are provided within operating section 4 and serve to illuminate the luminous flux onto the information plate 1. A single light emitting device may be used as a light source. Light receiving sections 10, 14, and 11 are provided and may be photodiodes, phototransistors, or other suitable optical receiver means. As shown in Fig. 3, the receivers 10, 14, and 11 are not covered or protected in any way.

In the system of the subject Patent Application, however, as shown in Fig. 3 of the subject Patent Application Drawings, the phototransistors 21 are received by the transparent casing 22 and are covered and protected by the transparent casing 22. The photoreceptive elements of the Tsunekuni reference are susceptible to dust, other optical interference factors, and also to mechanical stress, which may cause misalignment. In the system of the subject Patent Application, however, the phototransistors 21 are completely

covered and protected by casing 22, which provides protection from dust and other optical aberration factors, and also provides protection from mechanical stress and strain.

Thus, the Tsunekuni reference does not provide for: "...a transparent casing defining a recess therein, said optic sensor being received within said recess, said transparent casing covering and protecting said optic sensor...", as is clearly provided by newly-amended Independent Claim 1.

Thus, based upon newly-amended Independent Claim 1, it is not believed that the subject Patent Application is anticipated by, or made obvious by, the Tsunekuni reference when Independent Claim 1 is carefully reviewed.

The Examiner has additionally rejected Claim 2 under 35 U.S.C. § 103(a) as being unpatentable over the Tsunekuni reference in view of the Gordon Patent Application Publication #2002/0093486 A1. It is the Examiner's contention that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Tsunekuni by including the transparent "window" casing of Gordon.

The Gordon reference is directed to a seeing eye mouse for a computer system. As shown in Fig. 1, an LED 2, which may be an IR LED, emits light which is projected by lens 3, through orifice 13 in bottom surface 6, and onto a region 4 that is part of a work surface 5. Although it has been omitted for clarity, the orifice 13 might include a window that is transparent for the light from LED 2, and which would serve to keep dust, dirt, or other contamination out of the innards of the seeing eye mouse.

As shown in Fig. 1 of the Drawings, such a window covering orifice 13 would be essentially planar in construction. Additionally, it would extend across orifice 13 and not specifically cover any of the optical elements. The window 13, as described on Page 4, Paragraph 27 of the Specification, is merely available to protect the general “innards” of the mouse.

The system of the subject Patent Application, however, as shown in Fig. 3 of the subject Patent Application Drawings, provides for a specific transparent casing 22 which defines a recess formed therein for specifically receiving phototransistors 21. The concave shape of transparent casing 22 allows phototransistors 21 to be received within the transparent casing 22 for providing coverage and protection of the phototransistors 21. This not only prevents dust and other optically interfering factors from contaminating the phototransistors 21, but also provides protection against mechanical stress and strain, which could cause misalignment amongst the phototransistors.

Thus, neither the Tsunekuni reference nor the Gordon reference, when taken alone or in combination, provide for: “...a transparent casing defining a recess therein, said optic sensor being received within said recess, said transparent casing covering and protecting said optic sensor...”, as is clearly provided by newly-amended Independent Claim 1.

Thus, based upon newly-amended Independent Claim 1, it is not believed that the subject Patent Application is made obvious by either the Tsunekuni reference or the

Gordon reference, when taken alone or in combination, when Independent Claim 1 is carefully reviewed.

Additionally, the Examiner has rejected Claims 4, 5, 6, 8, and 10 under 35 U.S.C. § 103(a) as being unpatentable over the Tsunekuni reference in view of the Ebina Patent #5,943,233 and further in view of the Hutchison Encyclopedia "Microprocessor" description. It is the Examiner's contention that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the inventions of Tsunekuni and Ebina and that one would have been motivated to use the microprocessor of the Ebina invention in the invention of Tsunekuni based on the teaching of the Hutchison Encyclopedia, as presented on the website [tiscali.reference](http://tiscali.reference).

The Ebina reference is directed to an input device for a computer and the like and input processing method. As shown in Fig. 2, the optical sensor 32 includes a printed board 40 on which the LED 30 and the PSD 31 are mounted with a space therebetween and a light-shading resin case 41 covering the printed board 40. On the top surface of the case 41 are provided an emitted light pass hole 44 for allowing light emitting from the LED 30 to pass therethrough and a reflected light pass hole 46 for allowing only light reflected by a reflection plate 45 to pass therethrough to be incident on the PSD 31. The reflected light pass hole 46 is a conical shaped hole having a predetermined size and is formed above the PSD 31. The case 41 helps prevent dust from attaching to the PSD 31.

The case 41 is formed of a "light-shading" resin and is not transparent. The reflected light passes through a hole 46 formed in the casing 41. Thus, there is no direct protection for the optical receivers.

Though the system of Ebina is generally a closed system, the optical detectors or sensors do not have an additional casing covering them for providing protection and covering from both dust and also mechanical stress.

The Hutchison Encyclopedia reference is merely provided by the Examiner as a description of a general microprocessor.

As described above, the Tsunekuni reference does not teach or suggest the use of a separate cover or casing for the optical receiving elements.

In the system of the subject Patent Application, a transparent casing 22 is provided having a recess formed therein. The phototransistors 21 are received within the recess of the transparent casing 22 so that the transparent casing 22 may cover and protect the phototransistors 21 against dust, other optical aberrations, and further against mechanical stress and strain, which can cause misalignment of the phototransistors.

Neither the Tsunekuni reference, the Ebina reference, nor the Hutchison reference, when taken alone or in combination, teach or suggest the use of a transparent casing having a recess formed therein with the recess receiving the phototransistors, or other optical sensor means, therein, for providing coverage and protection.

Thus, neither the Tsunekuni reference, the Ebina reference, nor the Hutchison Encyclopedia reference, when taken alone or in combination, provide for: "...a transparent casing defining a recess therein, said optic sensor being received within said recess, said transparent casing covering and protecting said optic sensor...", as is clearly provided by newly-amended Independent Claim 1.

Thus, based upon the newly-amended Independent Claim 1, it is not believed that the subject Patent Application is made obvious by the Tsunekuni reference, the Ebina reference, or the Hutchison Encyclopedia reference, when taken alone or in combination, when Independent Claim 1 is carefully reviewed.

Further, the Examiner has rejected Claim 7 under 35 U.S.C. § 103(a) as being unpatentable over the Tsunekuni reference in view of the Ebina reference, and further in view of the Hutchison Encyclopedia description as applied to Claims 4 and 6 above, and further in view of the Analog Dialogue article.

The Analog Dialogue article by Moghimi is provided by the Examiner merely because it discloses operational amplifiers having hysteresis characteristics and further teaches a method to reduce noise in a comparator and cure instability. The Moghimi article is not directed to an optical mouse type system.

As described above, none of the Tsunekuni reference, Ebina reference, or Hutchison Encyclopedia description, taken alone or in combination, teach or suggest the

use of a transparent casing having a cavity or recess formed therein for receiving the photosensor elements.

The system of the subject Patent Application, however, as shown in Fig. 3 of the subject Patent Application Drawings, includes a transparent casing 22 having a recess formed therein for receiving the phototransistors 21. The transparent casing 22 completely covers and protects the phototransistors 21, thus offering protection from dust and other optical aberration factors, and further providing protection from mechanical stress and strain, which can cause misalignment of the optical elements.

Thus, neither the Tsunekuni reference, the Ebina reference, the Hutchison Encyclopedia reference, nor the Analog Dialogue article by Moghimi, when taken alone or in combination, provide for: "...a transparent casing defining a recess therein, said optic sensor being received within said recess, said transparent casing covering and protecting said optic sensor...", as is clearly provided by newly-amended Independent Claim 1.

The Examiner has additionally rejected Claim 9 under 35 U.S.C. § 103(a) as being unpatentable over the Tsunekuni reference in view of the Ebina reference, and further in view of the Hutchison Encyclopedia "microprocessor" description as applied to Claim 6 above, and further in view of the Clayton Patent #5,977,533. It is the Examiner's contention that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Tsunekuni reference in view of Ebina



and further in view of the Hutchison Encyclopedia description by adding the resistor between the phototransistor and the power supply in order to limit electrical current flowing through the phototransistor.

The Clayton reference is directed to a pulse width modulated optical sensor interface circuit having an emitter control circuit. This reference does not disclose an optical mouse system and is merely provided by the Examiner because it discloses that a connection of a resistor between a phototransistor and power source is conventional.

As described above, neither the Tsunekuni reference, the Ebina reference, nor the Hutchison Encyclopedia "microprocessor" description teach or suggest the use of a transparent casing for covering and protecting the photo-sensitive elements, thus, even when taken in combination with one another or with the Clayton reference, teach or suggest such an element.

The system of the subject Patent Application, however, as shown in Fig. 3 of the subject Patent Application Drawings, provide for a transparent casing 22 received within cavity 11 and having a recess formed therein. The recess receives phototransistors 21. Thus, the transparent casing 22 provides protection and coverage for the phototransistors 21, protecting them from both dust and other optical aberration factors, and further from mechanical stress and strain, which can provide for misalignment of the phototransistors.

Thus, neither the Tsunekuni reference, the Ebina reference, the Hutchison Encyclopedia description, nor the Clayton reference, when taken alone or in combination,

provide for: "...a transparent casing defining a recess therein, said optic sensor being received within said recess, said transparent casing covering and protecting said optic sensor...", as is clearly provided by newly-amended Independent Claim 1.

Thus, based upon newly-amended Independent Claim 1, it is not believed that the subject Patent Application is made obvious by either the Tsunekuni reference, the Ebina reference, the Hutchison Encyclopedia reference, or the Clayton reference, when taken alone or in combination, when Independent Claim 1 is carefully reviewed.

It is now believed that the remaining Claims 3-10 show patentable distinction over the prior art cited by the Examiner for at least the same reasons as those previously discussed for Independent Claim 1.

The remaining references cited by the Examiner, but not used in the rejection, have been reviewed, but are believed to be further removed when patentable distinctions are taken into account than those cited by the Examiner in the rejection.

MR1,115-383

Application Serial No. 10/082,275

Responsive to Office Action dated 12 February 2004

It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectfully requested.

Respectfully submitted,



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